

**AUTHORITY TO CONSTRUCT EVALUATION**

<b>APPLICATION NO.:</b>	<u>A/C 22270</u>
<b>DATE:</b>	<u>March 9, 2010</u>
<b>ISSUING ENGINEER:</b>	<u>Ady R. Santos</u>

- A. FACILITY NAME:** THE PROCTER & GAMBLE MANUFACTURING CO.
- B. LOCATION:** 8201 FRUITRIDGE RD., SACRAMENTO, CA 95826
- C. PROPOSAL:** MODIFICATION OF THE ESTER DRYER EXHAUST STREAM BY VENTING NON-CONDENSABLE EMISSIONS TO THE NORTH THERMAL OXIDIZER (NTO) [P/O 21602] WITH THE OPTION TO REVERT TO THE CURRENT SETUP OF VENTING TO THE ATMOSPHERE
- D. INTRODUCTION:**

Ester Making Process The ester dryer (Emission Source ID #1012) at the Procter & Gamble (P&G) Sacramento plant is one of the emissions unit in the esterification process. The esters, after leaving the wash columns, go to two ester storage tanks before entering the ester dryer, which removes water and methanol vapor. The ester dryer consist of an overhead condenser, separator and vacuum pump. The vacuum pump discharges the non-condensable vent stream to the atmosphere. Under P/O No. 22006 (Methyl Ester and Glycerine Manufacturing Process), the ester dryer has a potential to emit of 1,400 lb ROC per quarter. An annual source test is required to demonstrate compliance with the emissions limit.

Proposed Modification P&G proposes to vent the emissions from the ester dryer to the North Thermal Oxidizer (NTO), instead of venting to the atmosphere. This will be accomplished by installing new piping, flanges and valves. The NTO (P/O 21602) currently receives process vent streams from various emissions units in the methyl ester & glycerine and the fatty acids manufacturing processes. P&G has determined that the north thermal oxidizer has the capacity to process the added ester dryer emissions.

P&G's proposal to vent and control ester dryer emissions will involve a period of monitoring, feedback and adjustments in the ester making process and thermal oxidizer over a period of 12 to 18 months. During this time frame, they will establish process definitions under this process modification. P&G further proposes that the modified permit will allow, as a backup mode, the ester dryer to vent back to the atmosphere if technical problems are encountered when routing the ester dryer vent emissions to the thermal oxidizer. Refer to Exhibit '1' for the ester dryer vent stream mode scenarios.

**E. EQUIPMENT DESCRIPTION:**

Refer to Appendix 'A' for the equipment description.

**F. PROCESS RATE/FUEL USAGE:**

P&G proposed that when the ester dryer exhaust is vented to the North Thermal Oxidizer, the allowable process rate shall be the design throughput for the ester dryer, 138,230,000 lb/quarter esters (as permitted in P/O 20162). However, when the ester dryer is vented to the atmosphere (backup mode) during the process definition period, the process rate shall be limited to 97,152,000 lb/quarter (as permitted in P/O 22006).

During the most recent permit action (P/O 22006), P&G agreed to lower the ester dryer allowable throughput, from 138,230,000 to 97,152,000 lb/quarter. By using the actual source tests emission rate, which fluctuates for each testing due to the variability in the process parameters, the ester dryer emissions can potentially be exceeded if the process rate is not curtailed.

**G. OPERATING SCHEDULE:**

The Procter & Gamble plant operates 24 hours/day, 7 days/week

**H. CONTROL EQUIPMENT EVALUATION:**

The ester dryer exhaust will be vented to the North Thermal Oxidizer. The APC Thermal Oxidizer (NTO) has a design flow rate of 2,500 SCFM and P&G has determined that it has the capacity to process the additional ester dryer vent stream. The results of the source test conducted on the NTO in April 2008 indicated a destruction efficiency of 99%.

**I. EMISSIONS CALCULATIONS:**

**1) HISTORIC POTENTIAL TO EMIT:**

From P/O 22006 (Methyl Ester & Glycerine Manufacturing Process)

Pollutant	Historic Potential to Emit lb/quarter
ROC	5,142 (A)

(A) Potential to emit for the ester dryer is 1,400 lb/quarter.

**2) PROPOSED POTENTIAL TO EMIT:**

Pollutant	Proposed Potential to Emit lb/quarter
ROC	5,142 (A)

(A) Potential to emit for the ester dryer is 1,400 lb/quarter. Refer to Appendix 'B'.

**3) CALCULATION OF BACT TRIGGER:**

NEI (BACT) = Net Emissions Increase

= Proposed Potential to Emit - Historic Potential to Emit  
MPE = Maximum Potential Emissions on a 24-Hour Day Operation

Pollutant	NEI (BACT) lb/quarter	Is NEI (BACT) >0?	MPE lb/day	BACT Trigger Level lb/day	Is BACT Required?
ROC	0	No	>10	≥10	No
NOx	0	No	N/A	≥10	N/A
SOx	0	No	N/A	≥10	N/A
PM10	0	No	N/A	≥10	N/A
CO	0	No	N/A	≥550	N/A

**4) CALCULATION OF OFFSET TRIGGER FOR ROC AND NOx:**

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		ROC	NOx
P/O 11664	APC Methanol Adsorber	3,092	0
P/O 13590	APC Baghouse	0	0
P/O 13852	IC Engine Standby	92	1,290
P/O 16252	APC Rotoclone	0	0
P/O 16534	APC Methanol Adsorber	0	0
P/O 16564	Fire Pit Stack	0	0
P/O 16567	North Vent Seal Tank	920	0
P/O 17487	Wastewater Treatment System	2,038	0
P/O 17566	Heater (Dowtherm)	389	770
P/O 18457	Heater (Dowtherm)	120	398
P/O 18614	Heater (Hydrogen)	59	390
P/O 20123	APC Scrubber	0	0
P/O 20505	Fatty Acids Mfg Process	138	0
P/O 20993	APC Scrubber	2	0
P/O 21601	APC Thermal Oxidizer (STO)	107	482
P/O 21602	APC Thermal Oxidizer (NTO)	134	482
P/O 21765	South Vent Seal Tank	3,036	0
P/O 22004	Storage Tank Farm	597	0

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		ROC	NOx
P/O 22005	Physically Refined Oil Process	733	0
P/O 22006	Methyl Ester/Glycerine Mfg Proc	Modified in A/C 22270	
P/O 22007	Fatty Alcohol Mfg Process	30,221	0
P/O 22008	APC Methanol Scrubber	24	0
P/O 22033	Heater	46	301
A/C 22270	Methyl Ester/Glycerine Mfg Proc	5,142	0
Total		46,890	4,113
Offset Trigger Level		≥5,000	≥5,000

**5) CALCULATION OF OFFSET TRIGGER FOR SO<sub>x</sub>, PM<sub>10</sub> AND CO:**

Permit No.	Emissions Unit	Stationary Source Cumulative Emission Increase Since 01-01-77 lb/quarter		
		SO <sub>x</sub>	PM <sub>10</sub>	CO
P/O 11664	APC Methanol Adsorber	0	0	0
P/O 13590	APC Baghouse	0	148	0
P/O 13852	IC Engine Standby	15	92	279
P/O 16252	APC Rotoclone	0	130	0
P/O 16534	APC Methanol Adsorber	0	0	0
P/O 16564	Fire Pit Stack	0	0	0
P/O 16567	North Vent Seal Tank	0	0	0
P/O 17487	Wastewater Treatment System	0	0	0
P/O 17566	Heater (Dowtherm)	42	537	2,607
P/O 18457	Heater (Dowtherm)	13	166	809
P/O 18614	Heater (Hydrogen)	6	81	792
P/O 20123	APC Scrubber	0	0	0
P/O 20505	Fatty Acids Mfg Process	0	0	0
P/O 20993	APC Scrubber	0	0	0
P/O 21601	APC Thermal Oxidizer (STO)	8	101	1,113
P/O 21602	APC Thermal Oxidizer (NTO)	8	101	1,113
P/O 21679	South Vent Seal Tank	0	0	0

Permit No.	Emissions Unit	Stationary Source Cumulative Emission Increase Since 01-01-77 lb/quarter		
		SOx	PM10	CO
P/O 22004	Storage Tank Farm	0	0	0
P/O 22005	Physically Refined Oil Process	0	365	0
P/O 22006	Methyl Ester/Glycerine Mfg Proc	Modified in A/C 22270		
P/O 22007	Fatty Alcohol Mfg Process	0	0	0
P/O 22008	APC Methanol Scrubber	0	0	0
P/O 22033	Heater	5	63	2,451
A/C 22270	Methyl Ester/Glycerine Mfg Proc	0	0	0
Total		97	1,784	9,164
Offset Trigger Level		≥13,650	≥7,500	≥49,500

**6) CALCULATION OF EMISSION OFFSETS FOR ROC AND NOx:**

The emission offset trigger level for ROC has been exceeded in previous permit actions. Emission reduction credits have been provided by P&G for previous permit modifications that resulted in emissions increase. Therefore, emission offsets for ROC are not required for this permit action.

Emission offsets are not triggered for NOx. Therefore, emission offsets are not required.

**7) CALCULATION OF EMISSION OFFSETS FOR SOx, PM10 AND CO:**

Emission offsets are not triggered for SOx, PM10 and CO. Therefore, emission offsets are not required.

**J. COMPLIANCE WITH RULES AND REGULATIONS:**

**1) H&S Code § 42301.6 (AB 3205) COMPLIANCE:**

The Procter & Gamble facility is not located within 1,000 feet from the nearest school. Therefore, this permit action is not subject to the public notification requirements of H&S Code § 42301.6.

**2) NSR COMPLIANCE:**

Rule 202 - New Source Review

Section 112 - Exemption - Notification Requirements The potential to emit from this emissions unit exceeds the ROC exemption level shown below. However, there is no increase in the potential to emit. Therefore, public noticing pursuant to the requirements of Sections 405, 406, 407 and 409.2 is not required.

<u>Pollutant</u>	<u>lb/qtr</u>
ROC	5,000
NOx	5,000
SOx	13,650
PM10	7,500
CO	49,500

Section 301 - Best Available Control Technology The proposed potential to emit from this emissions unit does not meet or exceed the BACT threshold for the affected pollutant as specified in Section 301.1 and below. Therefore, BACT will not be required for ROC.

<u>Pollutant</u>	<u>lb/day</u>
ROC	10
NOx	10
SOx	10
PM10	10
CO	550

Section 302 - Offset The cumulative emission increase for this stationary source exceeds the ROC offset trigger level as specified in Section 302.1 and below. Emission reduction credits have been provided by P&G for previous permit modifications that resulted in emissions increase. Therefore, emission offsets will not be required.

<u>Pollutant</u>	<u>lb/qtr</u>
ROC	5,000
NOx	5,000
SOx	13,650
PM10	7,500
CO	49,500

Section 307 – Denial, Failure to Meet CEQA

The SMAQMD utilizes *Guide to Air Quality Assessment in Sacramento County, SMAQMD, July 2004* as guide during the initial study phase of a proposed project to determine the level of review necessary under CEQA.

- ROC and NOx – The average daily emissions from this process permit are below the trigger levels of 65 lb/day for ROC and NOx.
- Other pollutants – The project does not result in operational emissions that could lead to violations of any applicable state Ambient Air Quality Standards.
- Toxic Air Contaminants – The project does not trigger T-BACT requirements.
- Cumulative TACs – The project is not located near any sources identified in the AB2588 program which result in a cumulative risk greater than 10 in one million. A Health Risk Assessment (HRA) Report (February 2010) was submitted by P&G in accordance with the requirements of AB2588. The health risk assessment was prepared based on 2006 emissions data showing the following results:

Receptors		Excess Cancer Risk	Noncancer HI	
			Chronic	Acute
Point of Maximum Impact & Maximum Exposed Industrial Worker	Receptor 179	1.0 E-07	<1	<1

Receptors		Excess Cancer Risk	Noncancer HI	
			Chronic	Acute
Maximum Exposed Individual Resident	Receptor 177	6.62 E-08	<1	<1
Sensitive Receptor	Receptor 002	8.66 E-08	<1	<1

As the project does not exceed any of the criteria above, the project does not require further CEQA review.

#### Section 404 – Enhanced New Source Review

P&G requested that this permit application be reviewed in accordance with the enhanced new source review process. Accordingly, the procedures specified in Sections 401 – 408 of Rule 207 (Title V Federal Operating Permit Program) and 40 CFR 70, Section 70.6(a) – 70.6(g), 70.7(a), and 70.7(b) shall be followed.

Sections 405, 406, 407 and 409.2 – Preliminary Decision, Publication & Public Comment and Final Action The District's preliminary decision to approve this Authority to Construct shall be transmitted to the U.S. EPA and CARB, and published in a newspaper of general circulation, allowing for a 30-day public comment period. At the end of the review and comment period, the District shall provide a written notice of the final action to the applicant, the U.S. EPA and CARB and publish such notice in a newspaper of general circulation. Since this is an enhanced NSR review, these procedures may satisfy the procedures specified in Rule 207, Sections 401 – 408 with the exception of the 45-day EPA review period.

### **3) RULE 207 – TITLE V - FEDERAL OPERATING PERMIT PROGRAM:**

Section 233.3 defines one of the criteria in determining if a Title V permit modification is significant. A Title V permit modification is significant if it involves a case-by-case determination of an emission limit or other standard, among others. This permit action did not trigger BACT, hence a case-by-case determination was not performed. Therefore, this is not a significant Title V permit modification.

Pursuant to Section 220, minor Title V permit modification is a modification to a federally enforceable condition in a Title V permit to operate if it:

- a) is not a significant Title V permit modification;
- b) is not an administrative Title V permit modification; and
- c) does not violate any applicable requirements which are federally enforceable.

Sections 401 through 408 – Administrative Requirements These sections are administrative procedural requirements for all Title V permit processing and review. The enhanced NSR process will ensure that the requirements for application completeness determination, preliminary decision, public noticing and 30-day comment period for the preliminary decision, transmittal of preliminary decision to the U.S. EPA for a 45-day review, public objection, and notification and publication of final action on the permit application are met.

**4) PSD COMPLIANCE:**

Not applicable.

**5) PROHIBITORY RULES COMPLIANCE:**

**Rule 401 – Ringelmann Chart**

The synthetic organic chemical manufacturing operations at Procter & Gamble is expected to comply with the Ringelmann No. 1 or 20% opacity requirement of this rule.

**Rule 402 – Nuisance**

The chemical process is not expected to cause injury, detriment, nuisance or annoyance to the public. Based on the P&G's Health Risk Assessment Report (February 2010), the cancer risks and noncancer hazard indices identified for receptors at point of maximum impact and at points of maximum exposure to the individual resident and worker were considerably less than 1 in a million and 1, respectively.

**Rule 443 – Leaks from Synthetic Organic Chemical and Polymer Manufacturing**

Procter & Gamble is subject to the fugitive emission testing requirements of this rule. The facility has been implementing a Leak Detection and Repair (LDAR) program and has complied with the inspection and repair standards specified in this rule.

**Rule 464 – Organic Chemical Manufacturing Operations**

The process unit affected by this modification, ester dryer, does not have a potential to emit of 330 lb/day or more of uncontrolled ROC which would require a control device pursuant to Section 303.1. The current permit limit is 1,400 lb/quarter (average less than 16 lb/day) which is less than the required reduced uncontrolled emissions of 33 lb/day. This permit action plans for controlling ester dryer emissions by means of the North Thermal Oxidizer, hence will comply with this rule.

**6) NSPS COMPLIANCE:**

**40 CFR 60 Subpart VV – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry**

Procter & Gamble is considered a SOCMI source because of its production of methanol as a byproduct and mixed alcohols (typically C6 and higher). Methanol and various alcohols in this range appear on the list in Section 489. The affected facility consists of all the equipment listed in Section 481 within their respective process units. The process units are the methyl ester/glycerine and the fatty alcohol manufacturing processes. These process units, and the affected facilities, qualify for the exemption in Section 480 (d)(3) because the facility produces heavy liquid chemicals from heavy liquid feed. Therefore, the affected facility is exempt from the requirements of Section 482, but is required to maintain records as required by Section 486(i).

**40 CFR 60 Subpart NNN – Standards of Performance for Volatile Organic Compound Emissions (VOC) from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations**

This subpart applies to new or modified distillation units that produce any of the chemicals listed in Section 667. The affected facilities in the methyl ester/glycerine process are the four distillation units that process glycerine and methanol. Whereas, the four fatty alcohol stills and sodium methylate column are the affected facilities in the fatty alcohol manufacturing process. The ester dryer is not affected by this subpart.

## 7) NESHAP COMPLIANCE:

### 40 CFR 63 Subpart F – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry

This subpart, called HON, applies to facilities that meet all of the following criteria:

- a) Facilities that manufacture as a primary product one or more of the chemicals listed in Table 1, Section 106.
- b) Facilities that use as a reactant or manufacture as a by-product, co-product, or intermediate one or more of the chemicals listed in Table 2, Section 106.
- c) Facilities that are not located at a plant that is a major source per Section 112(a).

Procter & Gamble does not produce any of the products listed in Table 1. Therefore, this subpart is not applicable.

### 40 CFR 63 Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers

This subpart applies to industrial process cooling towers that use chromium containing water treatment chemicals. This regulation prohibits the use of such chemicals. P&G operates a cooling tower in their Physically Refined Oil process. Therefore, this facility is prohibited from using chromium-containing chemicals in their cooling tower.

### 40 CFR 63 Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

P&G is subject to this amended regulation. P&G is in compliance with the requirements of this subpart as of the extended deadline on May 9, 2009.

A summary of the MON MACT compliance standards for existing and new or reconstructed facilities are shown in the table below:

Miscellaneous Organic Chemical Manufacturing Subpart FFFF MON MACT Compliance Requirements		
Processing Unit	Existing Facilities	New and Reconstructed Facilities
1. Process Vents - Continuous	Either reduce organic HAP by $\geq 98\%$ , closed-vent system to a flare, $\leq 20$ ppmv outlet, or minimum TRE $> 1.90$ .	Either reduce organic HAP by $\geq 98\%$ , closed-vent system to a flare, $\leq 20$ ppmv outlet, or minimum TRE $> 1.9$ .

Miscellaneous Organic Chemical Manufacturing Subpart FFFF MON MACT Compliance Requirements		
Processing Unit	Existing Facilities	New and Reconstructed Facilities
2. Process Vents - Batch	For total batch vent emissions $\geq 10,000$ lb/year, reduce organic HAP by $\geq 98\%$ , or $\leq 20$ ppmv outlet; Alternatively, reduce organic HAP by $\geq 95\%$ using recovery devices.	For total batch vent emissions $\geq 3,000$ lb/year, reduce organic HAP by $\geq 98\%$ , or $\leq 20$ ppmv outlet; Alternatively, reduce organic HAP by $\geq 95\%$ using recovery devices.
3. Process Vents - Hydrogen Halide (HF/HCl) and Halogen (Cl <sub>2</sub> ) HAPs	For total process uncontrolled halogen halide and halogen HAP emissions $\geq 1,000$ lb/year, reduce by $\geq 99\%$ or $\leq 20$ ppmv outlet for combustion and non-combustion streams.	For total batch vent emissions $\geq 1,000$ lb/year of Hydrogen Halide and Halogen HAP, reduce HAP by $\geq 99\%$ or $\leq 20$ ppmv outlet for combustion and non-combustion streams.
4. Process Vents - Particulate Matter HAPs	No control required.	For total batch vent emissions $\geq 400$ lb/year Particulate Matter, reduce PM HAP by $\geq 97\%$ by weight.
5. Storage Tanks	Reduce organic HAP emissions $\geq 95\%$ or to $\leq 20$ ppmv of TOC or organic HAP or IFR/EFR ( $\geq 10,000$ gallons and $\geq 1.0$ psia).	Reduce organic HAP emissions $\geq 95\%$ or to $\leq 20$ ppmv of TOC or organic HAP or IFR/EFR ( $\geq 10,000$ gallons and $\geq 1.0$ psia).
6. Transfer Racks	Reduce organic HAP emissions $\geq 98\%$ or to $\leq 20$ ppmv for facilities that transfer $>0.17$ million gallons per year and $\geq 1.5$ psia.	Reduce organic HAP emissions $\geq 98\%$ or to $\leq 20$ ppmv for facilities that transfer $>0.17$ million gallons per year and $\geq 1.5$ psia.
7. Leak Detection Program	Full leak detection program with monitoring for all MCPU associated systems. Batch processes must comply with Subpart TT or Subpart UU. Continuous processes must comply with either Subpart H (CAR) or Subpart UU. An MCPU with at least one continuous process vent (even if the process is otherwise batch) must comply with Subpart UU.	Full leak detection program with monitoring for all MCPU associated systems. All processes must comply with Subpart H (CAR) or Subpart UU.

Miscellaneous Organic Chemical Manufacturing Subpart FFFF MON MACT Compliance Requirements		
Processing Unit	Existing Facilities	New and Reconstructed Facilities
8. Wastewater Treatment	Control if $\geq 50$ ppmv Table 8 and $\geq 10,000$ ppmv Tables 8 and 9, or $\geq 1,000$ ppmv Tables 8 and 9 and flowrate of $\geq 1$ lpm, or $\geq 30,000$ ppmv Table 9 and $> 1$ TPY. Develop and implement Maintenance WW plan, cleaning fluids are considered process fluids. Vapor suppression and route to closed-vent system with $\geq 95\%$ removal.	Control of very volatile organic HAP if $\geq 10$ ppmv and $\geq 50$ ppmv Table 8 and $\geq 10,000$ ppmv Tables 8 and 9, or $\geq 1,000$ ppmv Tables 9 and flowrate of $\geq 1$ lpm, or $\geq 4,500$ ppmv Table 9 and $\geq 1$ TPY. Vapor suppression and route to closed-vent system with $\geq 95\%$ removal.

In accordance with the reporting requirements under the MON NESHAP [40 CFR 63.2520(d)], P&G submitted a Notification of Compliance Status (NOCS) Report on October 5, 2009. And on January 27, 2010, P&G submitted the Annual Compliance Certification for calendar year 2009.

**K. RECOMMENDATIONS:**

This equipment should comply with all applicable District rules and regulations. An authority to construct/modify the Ester Dryer in the Methyl Ester & Glycerine Manufacturing Process should be issued to The Procter & Gamble Manufacturing Co. with the following conditions.

**L. CONDITIONS:**

***Refer to conditions in Authority to Construct No. 22270.***

PREPARED BY: Ady R. Santos  DATE: March 9, 2010

REVIEWED BY:  DATE: 3-17-2010